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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,723	12/05/2003	Soo Hyun Kim	9665-2	2626
30448	7590	01/20/2006	EXAMINER	
AKERMAN SENTERFITT			TURNER, SAMUEL A	
P.O. BOX 3188			ART UNIT	PAPER NUMBER
WEST PALM BEACH, FL 33402-3188			2877	

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

28

Office Action Summary	Application No. 10/729,723	Applicant(s) KIM ET AL.	
	Examiner Samuel A. Turner	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/22/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is confusing in that the second beam splitter divides the white light, which is a polychromatic light, into split monochromatic light beams. There is no antecedent basis for "the split monochromatic light beams". The configuration of the Michelson interferometer is indefinite. Applicant claims the Michelson interferometer as "located between the second beam splitter and reference mirror plane". However, the Michelson interferometer(30) includes both the second beam splitter(32) and the reference mirror(33). How can the interferometer be between components which form the interferometer ? The reference characters. Beam splitter 32, found recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. However the reference characters must be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the

claims. The use of reference characters is to be considered as having no effect on the scope of the claims, see 608.01(m).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kim et al(5/2002, Measurement Science and Technology).

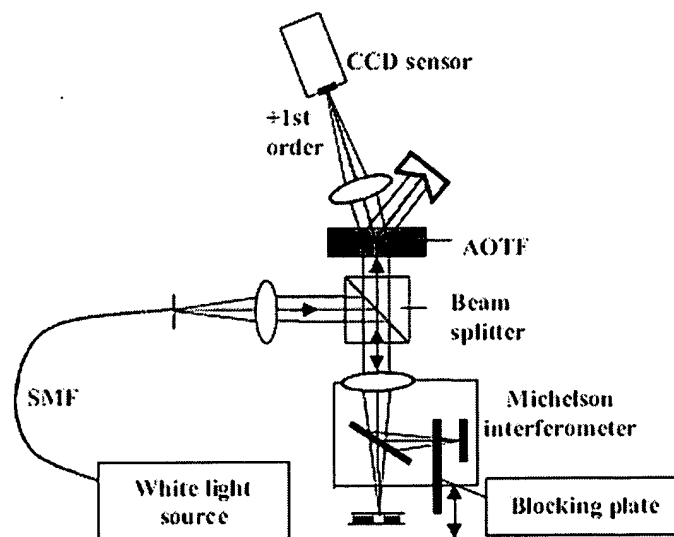


Figure 1. Schematic diagram of the proposed AOTF-based thickness profilometer.

With regard to claim 1 Kim et al teach a system for measuring the three-dimensional shape of a transparent thin film using an acousto-optic tunable filter, comprising:

- a light source for emitting white light(White light source);
- a second beam splitter for reflecting and transmitting the white light emitted from the light source to split the white light and irradiate the split monochromatic light beams toward a reference mirror plane and a measurement object(the beam-splitter in the Michelson interferometer);

- a Michelson interferometer module(Michelson interferometer) located between the second beam splitter and reference mirror plane(the reference mirror in the Michelson interferometer), to correspond to a reflection angle of the second beam splitter, the Michelson interferometer module including a blocking plate(Blocking plate) for selectively blocking the white light beam irradiated on the reference mirror plane;

- an acousto-optic tunable filter(AOTF) located in the traveling direction of white light selectively reflected from the reference mirror plane according to whether the white light is blocked or not and white light reflected from the measurement object, and adapted to select a monochromatic light beam of a specific wavelength band from the white light irradiated on the surface thereof;

- a first beam splitter of non-polarized cubic type located to correspond to the projection direction of white light emitted from the light source and the projection

direction of white light emitted from the second beam splitter 32, and adapted to allow reflection and transmission of white light to be sequentially carried out among the light source, the second beam splitter and the acousto-optic tunable filter(Beam splitter); and

a CCD sensor on which the monochromatic light beam selected by the acousto-optic tunable filter is irradiated to form a spectral image(CCD sensor), see figure 1.

As to claim 2, wherein the measurement object is composed of a metal layer with a patterned surface formed on a wafer and a thin film with a patterned surface formed on the metal layer (page L4).

As to claim 3, further comprising a single-mode optical fiber(SMF) one end of which is connected to the light source in the projection direction of white light emitted from the light source and the other end of which is fixed to correspond to a reflection angle of the first beam splitter.

As to claim 4, further comprising a first convex lens(the collimating lens) located between the single-mode optical fiber and the first beam splitter so that light width according to the traveling direction of white light projected from the single-mode optical fiber is aligned before the white light is irradiated to the first beam splitter.

As to claim 5, wherein the Michelson interferometer module further includes a second convex lens(the focusing lens) placed between the first and second beam splitters so as to focus the white light on the second beam splitter.

As to claim 6, further comprising a third convex lens(the imaging lens) located between the CCD sensor and the acousto-optic tunable filter so as to focus the selected monochromatic light on the CCD sensor.

As to claim 7, wherein the reference mirror plane is a plane reflection mirror located to correspond to the irradiating direction of the white light(the plane reference mirror in the Michelson interferometer).

The Kim et al reference is clearly applicant's invention having a publication date 31 May 2002 which is more than 1 year prior to applicant's filing date and is therefor a statutory bar under 35 U.S.C. 102(b).

Relevant Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim et al(11/2002, Optics Letters) discloses the use of an AOTF, see figure 1. Davidson(5,112,129) is cited as a white light interferometer incorporating a shutter 33 in the reference arm, see figure 1.

Art Unit: 2877

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Samuel A. Turner', with a stylized flourish at the end.

Samuel A. Turner
Primary Examiner
Art Unit 2877